



**Response Action Contract
for Remedial, Enforcement Oversight, and Non-Time
Critical Removal Activities at Sites of Release or
Threatened Release of Hazardous Substances
in EPA Region VIII**

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U.S. EPA Contract No. 68-W5-0022

**Technical Memorandum
Ambient Air Monitoring Summary
for the Period
December 1999 – September 2002
Libby, Montana**

October 22, 2002

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Acronyms

AHERA	Asbestos Hazard Emergency Response Act
CDM	Camp, Dresser, and McKee
MDEQ	Montana Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
F/cc	fibers per cubic centimeter
ISO	International Organization for Standardization
LCEH	Lincoln County Environmental Health Department
LA	Libby Amphibole
LPM	liters per minute
µm	micron
NIOSH	National Institute for Occupational Safety and Health
PCM	phase contrast microscopy
S/cc	Structures per cubic centimeter
TEM	transmission electron microscopy

Section 1

Introduction

At the request of the U. S. Environmental Protection Agency (EPA) Region VIII, CDM was tasked to summarize ambient air monitoring activities conducted by EPA, the Montana Department of Environmental Quality (MDEQ), Lincoln County, Montana, and other entities, in the community of Libby, Montana. Air monitoring conducted by EPA initially began as part of the emergency response action in December 1999, and continues today to 1) determine the ambient levels of asbestos present in indoor and outdoor air in order to develop a human health exposure and risk assessment, and to 2) evaluate ambient air conditions during site-specific activities. This technical memorandum focuses on outdoor ambient air sampling activities conducted by EPA and recent state/county air sampling efforts in the vicinity of Libby from December 1999 through September 2002, and summarizes analytical results based on data currently available.

1.1 Objectives

Ambient air sampling is conducted in Libby to determine ambient levels of asbestos, specifically Libby Amphibole (LA), present in outdoor air and to evaluate ambient air conditions during site-specific activities. Background ambient air sampling in Libby is conducted in residential homes and commercial properties, locations downwind from the mine, along Rainy Creek Road, and on properties scheduled for remediation.



1.2 Locations

The following paragraphs detail locations sampled by EPA and the State of Montana in order to address potential human health concerns and determine the presence of LA in the air at these locations. An overview of these air monitoring locations is presented as Figure 1, and detailed in Figure 2 (city proximity), Figure 3 (area south of Libby), and Figure 4 (mine area).

1.2.1 Stationary Monitoring Locations in Libby

EPA has conducted air sampling at various stationary locations around Libby to characterize ambient air conditions in areas of the community that are of particular concern (e.g., schools). The following stationary monitoring locations were sampled during the 2000 field season as part of the initial (Phase 1) site investigation:


- Fitness Center at the City Hall Building (952 East Spruce Street) – single station monitored approximately monthly (Figure 2)
- Libby Middle School (101 Ski Road) - single station monitored approximately monthly (Figure 2)
- Libby High School (150 Education Way) - single station monitored approximately monthly (Figure 2)

- McGrade Elementary School (899 Farm to Market Road) – single station monitored approximately monthly (Figure 3)
- Plummer Elementary School (currently Kootenai Head Start, 247 Indian Head Road) – single station monitored approximately monthly (Figure 2)
- Vermiculite Mine – four stations monitored over a 3-day period approximately monthly (Figure 4)
- Rainy Creek Road (mine road) – various stations monitored monthly during spring and fall (Figure 4)

1.2.2 Montana Department of Environmental Quality/Lincoln County Air Monitoring Station

Under the MDEQ air monitoring compliance program, Lincoln County Environmental Health Department (LCEH) personnel collected samples from an air monitoring station located on the roof of the Lincoln County Annex building at 418 Mineral Avenue in Libby (Figure 2). The monitoring station is approximately 25 feet above street level located in the downtown business area of Libby. Sampling typically occurred on a weekly basis between August 20, 2001 and February 13, 2002.

1.2.3 Background Sampling

cleanup Background sampling is conducted to determine ambient air conditions at sites where ~~vermiculite removal~~ will be conducted. Background air samples from eight locations were collected prior to removal/construction activities on each side of the work zone perimeter or in locations proximate to the work area. These locations, indicated by street address, are presented on Figures 2 and 3. The results of the background air samples are later compared against air samples collected during removal activities to determine if the removal activities have created elevated levels of asbestos in the air. 

1.2.4 FA-1

An ambient air monitoring station (FA-1) was established in July 2001 on the northwestern boundary of the River Runs Through It subdivision to monitor dust and potential asbestos release related to excavation activities at the adjacent property, known as the Flyway, owned by the Kootenai Development Corporation. FA-1 is positioned on the boundary between the Flyway and the River Runs Through It subdivision, near the landowner's beach, 250 feet west of the Kootenai River (Figure 4). In addition, in order to address concerns of residents living within the subdivision regarding ambient air conditions during times when no removal/construction activities are occurring, monthly monitoring began in January 2002 and continues to the present.

1.2.5 Stimson Lumber Property Air Investigation

Ambient air samples were collected at the Stimson Lumber Property as part of the Property-Specific Sampling and Analysis Plan, Air and Dust Sampling for Stimson Lumber Company, Libby Asbestos Project, Libby, Montana, dated August 23, 2002. Ambient air sampling was conducted to characterize ambient air conditions in the area of the former vermiculite exfoliation plant and in the log yard on Stimson Lumber Company's property (Figure 2). These results are currently under review by EPA.

1.2.6 Lincoln County Landfill

Ambient air sampling was conducted over several days at the Lincoln County Landfill in June 2001 to characterize ambient air conditions during landfill operations (Figure 2). Ambient air sampling locations included the entrance gate to the landfill and three locations positioned over the landfill disposal area.

1.3 Quality Assurance/Quality Control

This technical memorandum presents data collected during air monitoring activities in Libby during the period December 1999 through September 2002. Air samples were collected in accordance with the following work plans:

- Phase 1 Sampling and Quality Assurance Project Plan for Environmental Monitoring for Asbestos in Libby, Montana, Revision 1, prepared for EPA by ISSI, Inc., January 4, 2000, with modifications
- Removal Action Sampling and Analysis Plan for Confirmation Sampling of Soil and Perimeter and Personal Sampling of Air for Asbestos, prepared for the U.S. Department of Transportation Volpe Center by CDM Federal Programs Corporation, September 2000, with modifications
- Property-Specific Sampling and Analysis Plan for Air and Dust Sampling for Stimson Lumber Company, Libby Asbestos Project, prepared for EPA by CDM, August 23, 2002

Quality assurance for air monitoring consists of submitting lot blanks and field blanks for analysis. Lot blanks are prepared by submitting 2 unused air cassettes per 100 cassettes from the same lot for analyses to ensure the lot has not been compromised. Field blanks are prepared during the sample period by removing the cap of the cassette for 30 seconds at the sampling location. The cassette is then sealed and submitted for analysis. A minimum of 2 field blanks or 10% of the total samples collected per batch are prepared. Field blanks are collected to ensure proper sample collection and analytical procedures, and other field and laboratory checks that measure the integrity of samples collected. All quality assurance requirements presented in the documents listed above were met.

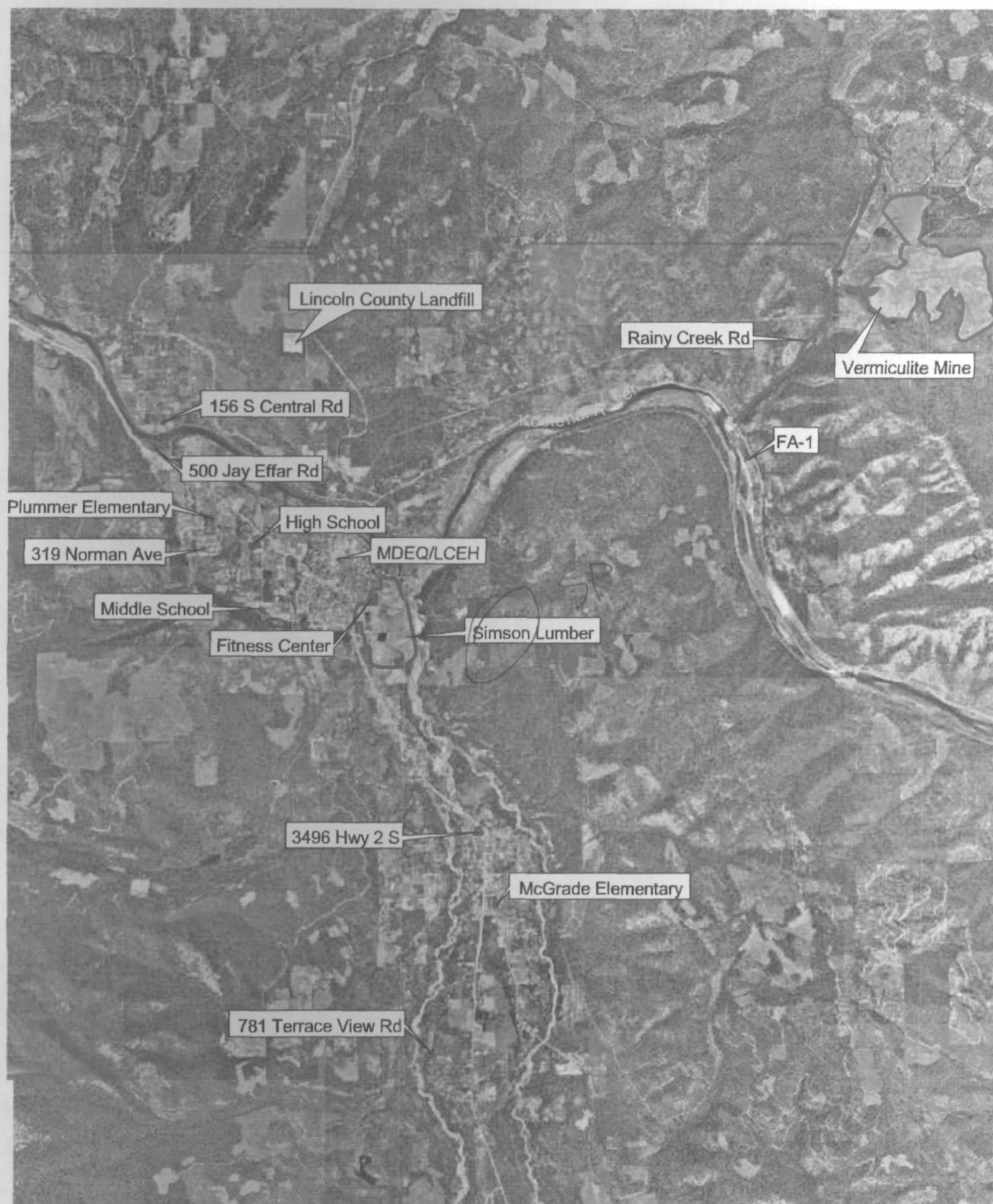
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Color Map(s)

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contain color that does
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Map Projection UTM Zone 11 NAD83 FT

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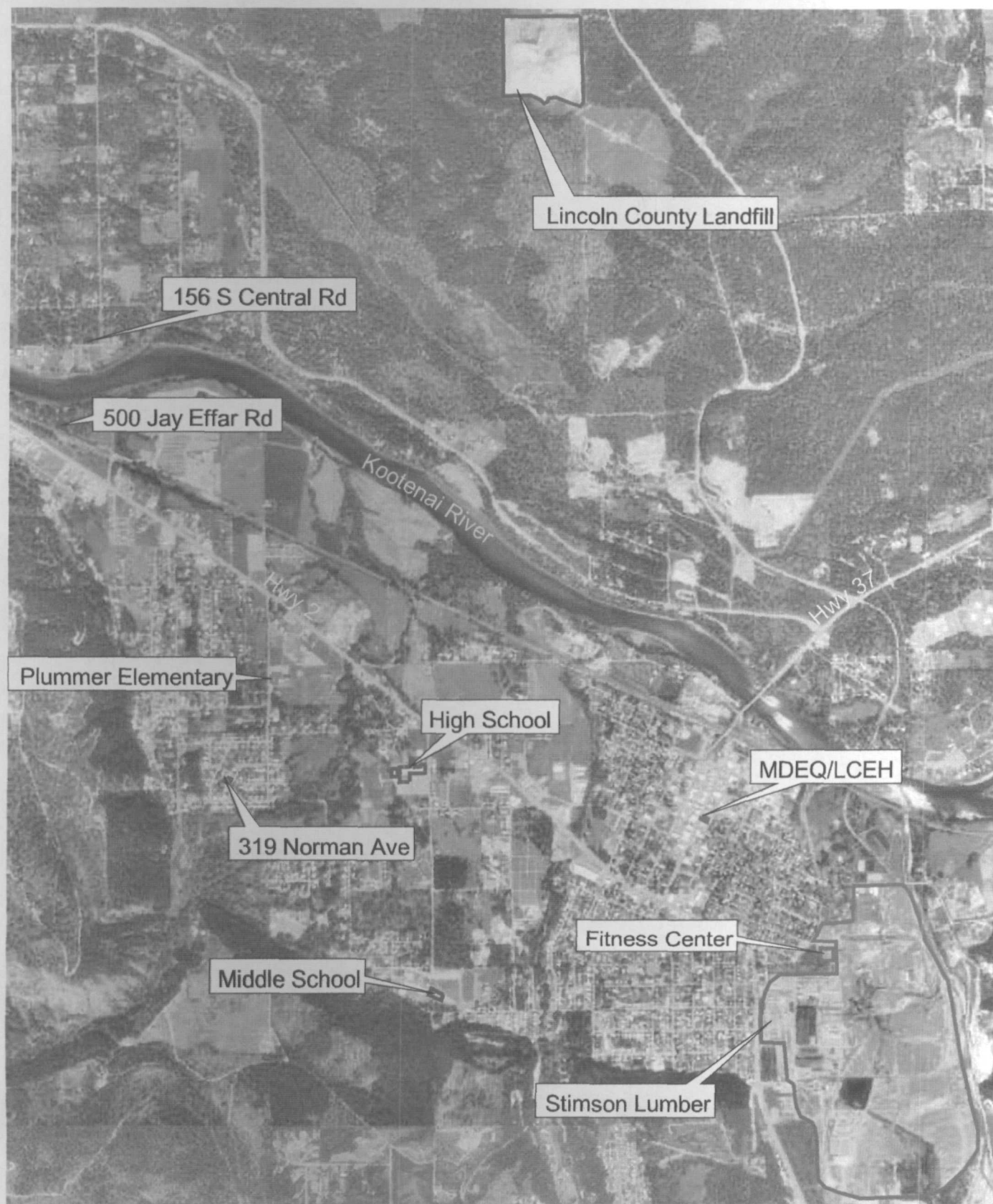


Air Sample Category

- ☐ Background
- ☐ Stationary
- ☐ Background/Stationary



Figure 1
Overview of
Air Monitoring Locations
Libby, MT



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Map Projection UTM Zone 11 NAD83 FT

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Air Sample Category
☐ Background
☐ Stationary
☐ Background/Stationary



Figure 2
Detail of Air Monitoring Locations
City Proximity
Libby, MT






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Air Sample Category

-  Background
-  Stationary
-  Background/Stationary

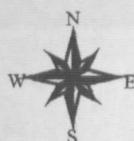
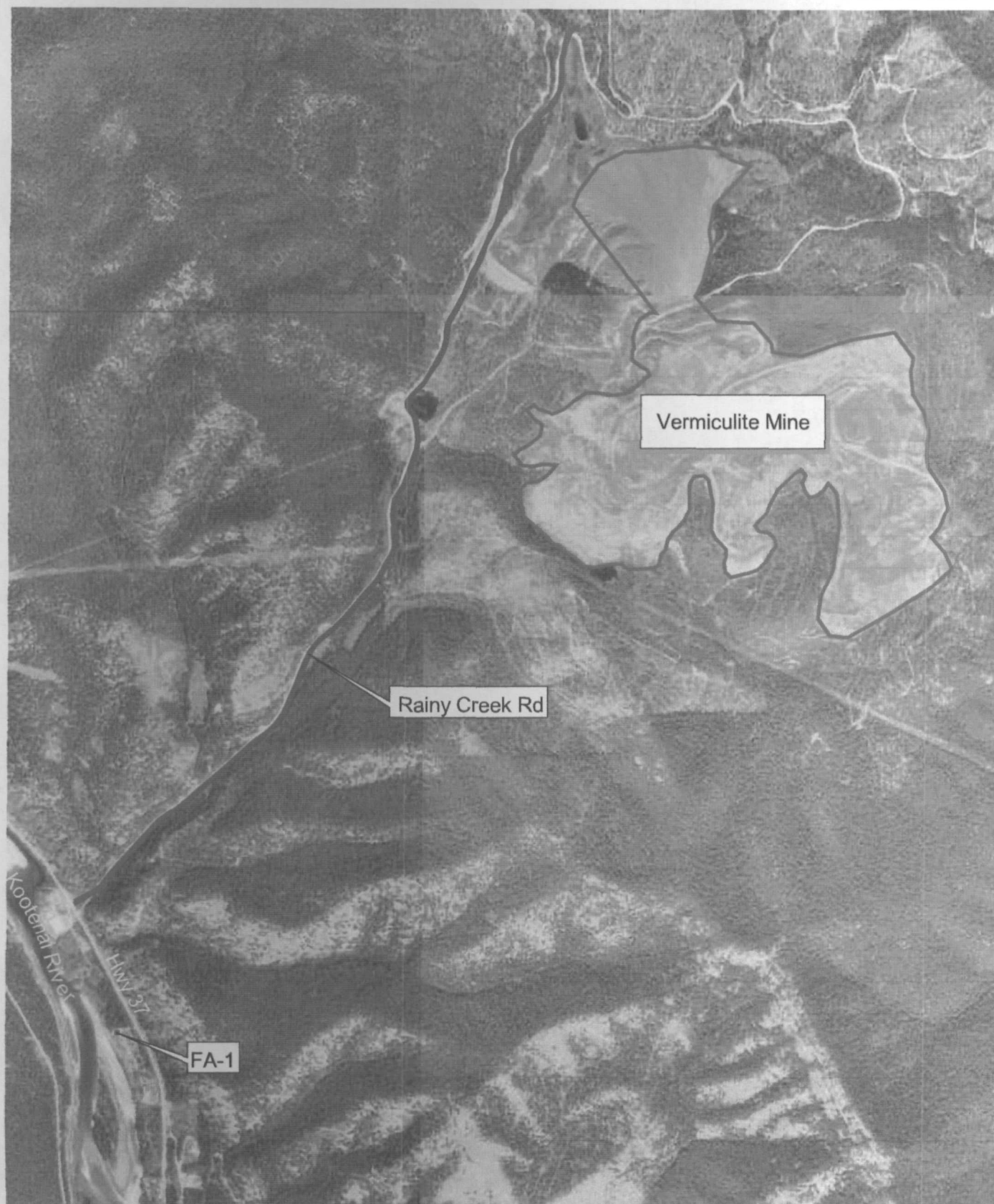


Figure 3
Detail of Air Monitoring Locations
South of Libby
Libby, MT



October, 2002

Map Projection UTM Zone 11 NAD83 FT

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Figure 4
Detail of Air Monitoring Locations
Mine Area
Libby, MT

Section 2

Air Sample Collection Procedures

Sampling for airborne asbestos has traditionally been conducted using air sampling pumps to draw air through a cassette containing a filter, which deposits the asbestos fibers and other particulate matter in the air stream onto the filter. The general procedure for collecting an air sample is described below.

2.1 Sample Position

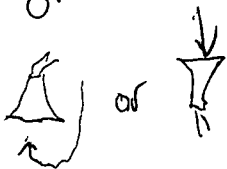
The sample position is determined by field personnel at the time of sample collection. Factors such as wind direction, location of contaminant, and exclusion zone boundary are considered when the air sample is positioned. The procedure for positioning the air sampling equipment is as follows:

The pump is placed adjacent to the pump stand and tygon tubing attached to the pump. The other end of the tygon tubing is then placed through the T-Ball on top of the pump stand. The air-sampling cassette is attached to the tubing and the pump is pre-calibrated to the desired flow rate using a rotometer. Following pre-calibration, the air sampling pump is started and the time and flow rate noted. Both the pump and flow rate are checked periodically throughout the duration of sampling. Air cassettes are typically directed towards the work area, or area of concern, at a 45-degree angle pointed towards the ground. At the end of the desired sampling time, the pump is stopped, the pump is post-calibrated with the rotometer, and the time and flow rate are noted. The cassette is then capped, a custody seal is placed over the cap, and the cassette is placed in a zip-top sample bag. Samples are then placed under chain of custody before being transported or shipped to the laboratory for analysis.

2.2 Volume

Two types of pumps are typically used for asbestos sampling: low-volume pumps and high-volume pumps. Low-volume sampling pumps are battery-operated pumps that can sample air for 8 to 12 hours, depending on the flow rate and filter material used. The pumps are typically used for conducting personal air sampling to determine worker exposure or for collecting a lower volume of air during ambient air sampling. The pumps operate at a flow rate of 1 to 4 liters of air per minute (LPM), and collect an air sample yielding approximately 60 to 1,500 liters of air.

High-volume sampling pumps are battery-operated or AC-powered. High-volume sampling pumps are used to collect air samples when the method requires a large volume of air. Since background air samples typically have lower asbestos concentrations than are present in asbestos-related work areas, a larger sample volume is required to achieve lower analytical sensitivity. In Libby, the pumps are often used for background ambient air sampling during investigations or final clearance air sampling. Battery-operated pumps can run for 2 to 24 hours depending

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on the battery used, while AC-powered pumps can run indefinitely. The pumps operate at a flow rate of 2 to 15 LPM, and collect an air sample yielding approximately 100 to 5,000 liters of air.

2.3 Calibration

Ambient air sampling flow rates are determined using a rotometer. The rotometer is calibrated to a primary flow onsite to account for the real-time temperature and barometric pressure. The industry standard practice is to calibrate the rotometers every six months. EPA contractors are required to calibrate rotometers on a monthly basis. Rotometers used by LCEH personnel are calibrated yearly.

Section 3

Analytical Methods

There are two basic technologies for measuring airborne asbestos fiber concentrations: phase contrast microscopy (PCM) and transmission electron microscopy (TEM). Both technologies involve using air sampling pumps to draw air through a filter, then examining the filter under a microscope to identify and report the number of particulates or asbestos fibers present per liter of air sampled. This type of sampling method is referred to as a time-integrated sample, since the air sample is collected over a specified period of time and the total fiber concentration or structure count is reported.

EPA has employed ^{general} PCM and TEM technologies to analyze air samples collected in Libby. EPA's methodology for using either PCM or TEM, or a combination of the technologies, is explained in this section.

3.1 Phase Contrast Microscopy

^{Most frequently used} ~~The current~~ methods for estimating risk from exposure to asbestos in air are based on the PCM method of quantification. PCM counts all fibers that are longer than 5 microns (μm) and have an aspect ratio of 3:1 or greater. PCM does not distinguish between asbestos fibers and non-asbestos fibers, and cannot identify fibers that are less than 0.25 μm in diameter. At sites where only airborne particulate matter is of concern, such as during removal of asbestos-containing materials, PCM is used to measure the effectiveness of engineering controls and to evaluate personal protectiveness of site workers.

^{Reference we use Risk memo} In 1969, the first membrane filter method for counting fibers, developed by the British Asbestos Research Council, was refined by the National Institute for Occupational Safety and Health (NIOSH) and published in the United States as P&CAM 239. This method was later revised as NIOSH Method 7400, *Fibers*, and is the standard method for analysis of airborne asbestos and other fibers by PCM. NIOSH 7400 is the method required by the Occupational Safety and Health Administration (OSHA) to evaluate occupational exposures to airborne asbestos. NIOSH 7400 results are reported as the number of fibers per cubic centimeter (f/cc).

NIOSH Method 7400 uses a phase contrast microscope to examine the filter and to count the number of fibers on a specified area of the filter. As previously mentioned, only fibers that are longer than 5 μm and have a 3:1 aspect ratio are counted. The advantage of the PCM method is that it is inexpensive compared to TEM. PCM sample preparation takes minutes versus hours for TEM samples, and samples can be analyzed quickly on-site for rapid determination of fiber concentration.

The primary disadvantage of PCM analysis is that it cannot differentiate between asbestos and non-asbestos fibers. TEM is the only technique capable of identification of specific types of asbestos fibers. Also, because of the low-resolution limit of the phase contrast microscope, fibers less than 0.25 μm in diameter are not visible. Therefore, significantly more fibers may be present than are optically visible by PCM. Since most fibers in ambient atmospheres are not asbestos, TEM is often used in conjunction with PCM to supplement the PCM analytical results.

3.2 Transmission Electron Microscopy

TEM analytical methods can positively identify the majority of individual fibers of asbestos and have adequate resolution to allow detection of small thin fibers.

Although PCM is the traditional method for estimating asbestos fibers in air, EPA determined that during the air sampling studies in Libby, only about one third of the total fibers observed by TEM would be counted using PCM analysis. In Libby, TEM is employed when airborne asbestos levels need to be positively identified. There are several published methods for TEM analysis of asbestos in air, two of which are utilized for the Libby project and are described below.

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3.2.1 TEM AHERA Method

NIOSH Method 7402 uses the same sampling procedures and counting rules as NIOSH Method 7400, but has the advantage over PCM of positive identification of asbestos fibers. Following removal activities, air samples are collected and analyzed by TEM to ensure that unacceptable levels of asbestos do not remain. Appendix A to the EPA's Asbestos Hazard Emergency Response Act (AHERA) standard contains the TEM method used to determine if asbestos response actions in schools have been adequately completed. A minimum of 1,199 liters of air is collected. Raw analytical data is reported in total structures greater than or equal to 0.5 μm in length and separately for fibers greater than 5 μm in length. However, there is no width or aspect ratio measurement. This method only reports analytical results in total asbestos structures per square millimeter (S/mm^2) of the filter, as required by TEM AHERA for abatement clearance. Analysis is designed to maintain analytical sensitivity of 0.005 structures per cubic centimeter (S/cc) of air based on volume and effective filter area.

3.2.2 TEM ISO 10312 Method

The International Organization for Standardization (ISO) 10312 method, published in 1995, is a TEM method applicable to the measurement of airborne asbestos in a wide range of ambient air situations and for a detailed evaluation of any atmosphere in which asbestos structures are likely to be present. ISO 10312 reports total asbestos structures greater than or equal to 0.5 μm in length and separately for fibers greater than 5 μm in length. For each asbestos structure detected, the type of asbestos, length, width, and aspect ratio are also reported. This method provides detailed characterizations of each asbestos structure to assist in the interpretation of health

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effects characteristics. ~~However, no regulatory comparison to TEM ISO 10312 can be performed due to the lack of an established industry or EPA standard.~~

Recent studies focus on the type of asbestos, fiber size, and concentration as all playing an important role in the toxicity of asbestiform fibers. As such, EPA is currently developing an alternative risk model that accounts for apparent differences in lung cancer risk as a function of fiber size and type of asbestos. Longer, thicker fibers are currently expected to display greater toxicity than shorter, thinner fibers. Although both PCM and TEM analyses of air samples are being performed in Libby, EPA is relying heavily on TEM ISO10312 to report the type, concentration, and fiber sizes of asbestiform minerals present for their on-going risk assessments. The method also allows for the results to be reported as PCM equivalent fibers so the data can be used with traditional risk models. In Libby, in areas where ambient background conditions were previously undetermined or when risk-based decisions need to be made, TEM is employed.

All the PCM and TEM methods discussed herein are based on the direct transfer method of sample preparation. Direct transfer means the specimen preparation procedures are designed to minimize the disturbance of the collected material. Air samples that are overloaded with particulate matter cannot be analyzed by PCM and TEM using the direct transfer method since the particulate matter obscures the fibers to be counted. Indirect transfer methods involve re-suspending the particulate matter in a solution and preparing a specimen by re-depositing a portion of the particulate matter. An advantage to the indirect transfer method is that even heavily loaded filters can be analyzed. As a result, much larger sample volumes can be collected. However, the indirect transfer method results in the disturbance of the particulate matter that can cause complex structures to disintegrate during preparation, resulting in an increased number of structures counted.

3.3 Analytical Methods Employed at Specific Locations

PCM and TEM AHERA results for ambient air samples collected between December 1999 and September 2002 are reported in Section 4. Available ISO 10312 data is presented in Attachment 2.

3.3.1 Stationary Monitoring Locations in Libby

Samples collected at stationary monitoring locations were analyzed primarily using TEM ISO 10312, although some PCM and TEM AHERA are available (see Attachment 1 – Ambient PCM and TEM AHERA Air Monitoring Data).

3.3.2 Montana Department of Environmental Quality/Lincoln County Air Monitoring Station

Samples collected at this station were analyzed using PCM and TEM ISO 10312.

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3.3.3 Background sampling

Background air samples were analyzed PCM, TEM AHERA, and TEM ISO 10312.

3.3.4 FA-1 During Winter Shutdown

FA-1 samples were analyzed using PCM, TEM AHERA, and TEM ISO 10312.

3.3.5 Stimson Lumber Property Air Investigation

Air samples collected during the Stimson Lumber Investigation were analyzed using PCM, TEM AHERA, and TEM ISO 10312. These results are currently under review by EPA and will be presented in their entirety in a separate report.

3.3.6 Lincoln County Landfill

Ambient air samples collected at the Lincoln County Landfill were analyzed using PCM, TEM AHERA, and TEM ISO 10312.

Section 4 Summary of Results

Table 1 presents a summary of ambient air sample results collected at the various locations discussed in this technical memorandum. This table presents statistics for data available in the Libby Version 2 database as of October 8, 2002. Data may not currently be available for several reasons, such as undergoing quality control/assurance review or pending electronic data deliverables from the laboratory.

PCM and TEM AHERA sample results for Libby ambient air monitoring are summarized in this section and presented in Attachment 1. TEM ISO 10312 sample results are presented in Attachment 2. In Libby, ISO 10312 is employed in areas where ambient background conditions were previously undetermined or when risk-based decisions need to be made. At this time, no regulatory comparison to TEM ISO 10312 is presented due to the lack of an industry or EPA standard for which to compare the data.

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4.1 Stationary Monitoring Locations in Libby

Thirty ambient air samples were collected between January 2000 and December 2000 from a stationary monitoring location in the yard area of the Fitness Center at 952 East Spruce Street (City Hall building). No PCM or TEM AHERA results are currently available for this location in the Libby Version 2 database as of October 8, 2002, and therefore no summary information is presented in this memorandum.

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Similarly, thirty ambient air samples were collected from a stationary monitoring location in the park area of McGrade Elementary School, approximately fifty feet from the restroom building. These samples were collected during the period January 2000 through December 2000. No PCM or TEM AHERA results are available in the Libby Version 2 database as of October 8, 2002 for this location.

Twenty-nine ambient air samples were collected between January 2000 and December 2000 from a stationary monitoring location in the play yard area at Plummer Elementary School. No PCM or TEM AHERA results are available in the Libby Version 2 database as of October 8, 2002 for this location.

During the period May 2000 through December 2000, 161 ambient air samples were collected from stations located along Rainy Creek Road and at the vermiculite mine, including the dam; the tailings pile; the top of the mine; near the upper, middle, and lower gates; and various mine waste disposal areas. PCM results are available for 24 of these samples. All reportable PCM results are below the EPA action level of 0.1 f/cc (EPA SOP 2015; 11/17/94: Rev. #0.0). Available TEM results identify seven air samples with detectable LA by TEM AHERA analysis (40 CFR 763, Appendix A). Subsequently, the seven air samples with identified structures by TEM AHERA

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analysis presented PCM results at concentrations below the EPA action level of 0.1 f/cc.

4.2 Montana Department of Environmental Quality/Lincoln County Air Monitoring Station

Thirty-three ambient air samples were collected from August 2001 through February 2002 at this station, which is located at 418 Mineral Avenue. Nine of these samples have reportable PCM results; all are below the EPA action level of 0.1 f/cc. Samples collected at this station were not analyzed by the TEM AHERA method.

4.3 Background Sampling

Ambient air samples were collected from eight monitoring station locations on July 26, 2001 at the Libby High School prior to track remediation activities. No PCM or TEM AHERA results are available in the Libby Version 2 database as of October 8, 2002 for this location.

Ambient air samples were collected from eight monitoring station locations on August 9, 2001 at the Libby Middle School prior to track remediation activities. In addition, samples were collected at four stations in the school parking on August 14, 2001. No PCM or TEM AHERA results are available in the Libby Version 2 as of October 8, 2002 database for this location.

On July 11, 2002, ambient air samples were collected from each side of the containment area, from a station located on Indian Head Road, and from three monitoring stations located on properties neighboring Plummer Elementary School. PCM results are available for eight of these samples, all of which are below the EPA action level of 0.1 f/cc. Reportable TEM results identify one air sample with detectable LA by TEM AHERA analysis. Subsequently, that air sample presented PCM results at concentrations below the EPA action level of 0.1 f/cc.

Prior to remediation activities, on August 2, 2002, three ambient air samples were collected from the residence located at 156 South Central Road. The samples were taken from the southwest, southeast, and northeast boundary of the remediation area. No PCM data are available for this location. One reportable TEM AHERA result was available, which showed no detectable LA.

Four ambient air samples were collected from the residence at 319 Norman Avenue on September 10, 2002 prior to removal activities. These were collected from each side of the containment area. PCM results are available for all four samples; all results are below the EPA action level of 0.1 f/cc. At this time, no TEM AHERA results are available for this location.

On July 14, 2001, ambient air samples were collected at six stations at 3496 U.S. Highway 2 South prior to remediation activities. No PCM or TEM AHERA results are available in the Libby Version 2 database as of October 8, 2002 for this location.

A total of four ambient air samples were collected on August 12, 2002 from the property located at 500 Jay Effar Road. The stations were positioned on each side of the containment area. PCM results are available for all four samples; results are below the EPA action level of 0.1 f/cc. TEM results are also available for the four samples collected. These samples showed no detectable LA.

On August 28, 2002, four ambient air samples were collected around the perimeter of the containment area located at 781 Terrace View Road. Samples were collected prior to removal activities. No PCM results are available in the Libby Version 2 database as of October 8, 2002 for these samples. TEM results identify no samples with detectable LA by TEM AHERA analysis.

4.4 FA-1 During Winter Shutdown

A total of 21 ambient air samples were collected at the FA-1 location from January 2002 through September 2002. PCM results are available for 18 of these samples. All reportable PCM results are below the EPA action level of 0.1 f/cc. Seventeen of the 18 samples analyzed by PCM were also analyzed by TEM AHERA. Of these 17 samples, 2 reported detectable LA by TEM AHERA analysis.

4.5 Stimson Lumber Property Air Investigation

Thirteen ambient air samples were collected during a three-day period in September 2002 at stationary monitoring locations on the Stimson Lumber property. Four of these samples have reportable PCM results, all of which are below the EPA action level of 0.1 f/cc. At this time, no TEM AHERA results are available for these samples.

4.6 Lincoln County Landfill

Between June 26 and June 28, 2001, four ambient air samples were collected from each of three sampling stations located within the landfill for a total of 12 samples. PCM results are available for all of these samples and are below the EPA action level of 0.1 f/cc. TEM results are also available for the twelve samples collected. Available TEM results identified no air samples with detectable LA by TEM AHERA analysis.

Table 1
Summary of PCM and TEM AHERA Ambient Air Sampling Results, Libby, Montana

Sampling Location	Number of Samples Collected	Number of Reportable Results	Number of Results greater than Detection Limit	Average	Minimum	Maximum	Standard Deviation
Fitness Center	30	0	---	---	---	---	---
McGrade Elementary	30	0	---	---	---	---	---
Plummer Elementary (stationary monitoring location)	29	7	4	---	---	---	---
Rainy Creek Road and Mine							
PCM	161	24	21	0.0040	0.0010	0.0190	0.0048
TEM AHERA	161	10	7	0.0097	0.0018	0.0311	0.0104
MDEQ/LCEH Station							
PCM	33	9	7	0.0114	0.0007	0.0340	0.0134
Libby High School	8	0	---	---	---	---	---
Libby Middle School	12	0	---	---	---	---	---
Plummer Elementary (background)							
PCM	8	4	2	0.0452	0.0023	0.0880	0.0606
TEM AHERA	8	4	1	0.0050	0.0050	0.0050	---
156 South Central Road	3	1	0	---	---	---	---
319 Norman Avenue	4	4	0	---	---	---	---
3496 U.S. Highway 2 South	6	0	---	---	---	---	---
500 Jay Effar Road							
PCM	4	4	2	0.0050	0.0050	0.0050	0
781 Terrace View Road							
TEM AHERA	4	4	4	0.0040	0.0050	0.0005	0.0005
FA-1							
PCM	20	18	3	0.0024	0.0020	0.0030	0.0005
TEM AHERA	20	17	3	0.0043	0.0042	0.0045	0.0004
Stimson Lumber							
PCM	13	4	4	0.0013	0.0010	0.0020	0.0005
Lincoln County Landfill							
PCM	12	12	2	0.0034	0.0020	0.0030	0.0007

Note: PCM results reported in Fibers per cubic centimeter; TEM AHERA results reported in Structures per cubic centimeter
--- = not reportable

TARGET SHEET
EPA REGION VIII
SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOCUMENT NUMBER: 2009567

SITE NAME: LIBBY ASBESTOS

DOCUMENT DATE: 10/22/2002

DOCUMENT NOT SCANNED

Due to one of the following reasons:

- ☐ PHOTOGRAPHS
- ☐ 3-DIMENSIONAL
- ☐ OVERSIZED
- ☐ AUDIO/VISUAL
- ☐ PERMANENTLY BOUND DOCUMENTS
- ☐ POOR LEGIBILITY
- ☐ OTHER
- ☐ NOT AVAILABLE
- ☒ TYPES OF DOCUMENTS NOT TO BE SCANNED
(Data Packages, Data Validation, Sampling Data, CBI, Chain of Custody)

DOCUMENT DESCRIPTION:

ATTACHMENT 1 Ambient PCM and TEM AHERA Air Monitoring Data -
December 1999 to September 2002
ATTACHMENT 2 Ambient TEM ISO 10312 Air Monitoring Data -
December 1999 to September 2002
